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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/024,107	12/17/2001	Sami Haapoja	872.0105.U1(US)	3127

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EXAMINER	
JAMAL, ALEXANDER	
ART UNIT	**PAPER NUMBER**
2614	

DATE MAILED: 04/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/024,107	HAAPOJA ET AL.	
	Examiner	Art Unit	
	Alexander Jamal	2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 December 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Based upon the submitted amendment (12-12-2005) , submitted via RCE, the examiner notes that claims 1,5,8,12,20 have been amended and claims 21-25 have been added.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. **Claims 21-23** rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims refer to an RF filter bandwidth. It is not clear exactly which RF filter bandwidth is being referred to.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. **Claims 1-11,13-23,25** rejected under 35 U.S.C. 103(a) as being unpatentable over Abdelgany et al. (6584090), and further in view of Shalom et al. (6166601) and further in view of Abdelmonem et al. (6622028).

As per **claims 1,8,15,20,25,** Abdelgany discloses a transceiver comprising a transmit path and receive path (Fig. 4). Both paths comprise RF filters (164,92,168,98,176,78,74,156 ect.). The system is a CDMA system with frequency band channels. The device further comprises antenna 22 coupled to both the transmit and receive paths. However, Abdelgany does not disclose circuitry to compensate for the non-linearity of both transmit and receive RF filters.

Shalom discloses a transceiver that applies digital equalization to the RF amplifier in order to produce highly linear amplification (Col 3 lines 29-65). The equalization (predistortion) is applied by equalizer 104 (Fig. 3) on the signal to be transmitted (via antenna 38) (Col 7 line 62 to Col 8 line 9). It would have been obvious to one of ordinary skill in the art at the time of this application to implement digital equalization for both the transmit and receive amplifiers for the advantage of producing a highly linear response from the amplifiers.

Abdelmonem discloses a transceiver (Col 3 line 60 to Col 4 line 15) and teaches that an equalizer may be used to compensate for the received signal that is subject to the non-linear behavior of the receive RF filters (Col 5 line 58 to Col 6 line 5) in wide channel systems such as W-CDMA. It would have been obvious to one of ordinary skill

in the art at the time of this application to implement digital equalization in the transceiver for the advantage of compensating for nonlinear filter effects.

As per **claims 2,3,9,10,** the device of the claim 1 rejection would compensate for all transmit and receive channels.

As per **claim 17,** Abdelgany discloses that the transceiver may be a direct conversion receiver.

As per **claims 4,5,11,16,** the device comprises an FIR which is a DSP (SHALOM: Col 3 lines 45-65, Col 7 line 62 to Col 8 line 9). The equalization circuit functions by changing coefficients in the equalizer.

As per **claims 6,7,13,14,18,19,** Abdelmonem discloses that the system may be a W-CDMA system, which has the same ranges of transmit and receive frequencies as specified in claim 6.

As per **claims 21-23,** examiner notes that it is well known in the art that RF filters may comprise a wide range of bandwidth values such as many hundred MHz. As such, the WCDMA signal (bandwidth of 60MHz in the US) transmitted may be greater than 10% of an rf filter bandwidth.

4. **Claims 12,24** rejected under 35 U.S.C. 103(a) as being unpatentable over Abdelgany et al. (6584090) in view of Shalom et al. (6166601) in view of Abdelmonem et al. (6622028) and further in view of Lindoff (6373888).

As per **claim 12,** Abdelgany, Shalom et al. (6166601) and Abdelmonem disclose the use of an equalizer implemented in an FIR filter, but they do not disclose that the number of taps may be varied in compensating for the transmit and receive signals.

Lindoff discloses an equalizer that has a variable amount of taps (ABSTRACT,). Lindoff teaches that a variable number of taps allows the equalizer to be adapted as a function of channel response and allows processing and power savings (Col 4 lines 15-40). It would have been obvious to one of ordinary skill in the art at the time of this application to implement a variable number of taps for the equalizer filter for the advantage of power and processor savings.

As per **claim 24,** Shalom Fig. 3 has no up or down converting of the received signal, as such the signal is processed (equalized) in a digital baseband.

Response to Arguments

5. Applicant's arguments have been fully considered but they are not persuasive.

As per applicant's arguments (remarks page 7-8) that Shalom does not teach to implement equalization for filter induced distortion responsive to RF channels, examiner contends. Examiner further notes that the RF amplifier is read as comprising an RF filter (the frequency response of the amplifier and any associated circuitry with the amplifier-see Shalom Col 3 lines 35-37).

As per applicant's arguments that Shalom does not teach equalizing on the recive signal, examiner notes the cited Abdelmonem reference.

As per applicant's arguments (remarks page 7) that none of the cited art discloses equalization that is responsive to the currently selected RF channel, examiner disagrees. An equalizer inherently (by definition) comprises a frequency response across the entire spectrum. That frequency response is 'responsive' (@ the frequency of interest) to whatever channel within a particular frequency range is being fed into the equalizer at that moment. The Shalom and Abdelmonem references disclose that equalization is used to counter the non-linear effects of the amplifiers/filters, as such those equalizers would comprise the appropriate phase/frequency response for all channels being fed through the filters/amplifiers. Examiner further notes that the frequency response of the equalizer will 'selectively compensate' for each channel based upon the frequency band of the channel as an equalizer is defined by a certain gain/phase at a certain frequency.

As per applicant's remarks concerning claim 2 (remarks page 10), examiner notes that all equalizers would function over the entire signal bandwidth, which would include all transmit and all receive channels.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Jamal whose telephone number is 571-272-7498. The examiner can normally be reached on M-F 9AM-6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis A Kuntz can be reached on 571-272-7499. The fax phone numbers for the

organization where this application or proceeding is assigned are **571-273-8300** for regular communications and **571-273-8300** for After Final communications.

AJ
March 31, 2006